UCRSF
2.1-4
12/4/06

Kevin Rochlin/R10/USEPA/US
12/04/2006 02:04 PM

To Bruce Duncan/R10/USEPA/US@EPA
cc
bcc
Subject

From:

Kevin Rochlin, Project Manager
Office of Environmental Cleanup
United States Environmental Protection Agency
Region 10
1200 6th Avenue
Seattle, WA 98101
(206) 553-2106
(206) 553-0124 (fax)
rochlin.kevin@epa.gov

----- Forwarded by Kevin Rochlin/R10/USEPA/US on 12/04/2006 02:03 PM -----

"Roland, John L. (ECY)" <JROL461@ECY.WA.GOV>

08/18/2006 09:26 AM

To Sally Thomas/R10/USEPA/US@EPA, Kevin Rochlin/R10/USEPA/US@EPA
cc Jim.Stefanoff@CH2M.com, "Dowling, Brendan (ECY)" <BDOW461@ECY.WA.GOV>
Subject Draft Bioassay Report

Sally and Kevin - A request....It would be very useful if the following charts/tables could be provided in support of our evaluation of the bioassay and pore water report:

- Charts showing the relationship of TOC to bioassay stations
- Charts relating grain size to the bioassay results
- Revisions to charts 6-1 through 6-10 to label each bioassay data point so we can see exactly which station is being plotted on each histogram or plot.
- Enhancement of Table 5-3 to include a column(s) or flags on the data exceeding water quality acute, chronic, and NTR criteria for general comparison purposes, recognizing that these are pore water and not surface water results.

Thanks Much,
John

----- Forwarded by Kevin Rochlin/R10/USEPA/US on 12/04/2006 02:03 PM -----

"Roland, John L. (ECY)" <JROL461@ECY.WA.GOV>

08/18/2006 10:44 AM

To Sally Thomas/R10/USEPA/US@EPA, Kevin Rochlin/R10/USEPA/US@EPA
cc Jim.Stefanoff@CH2M.com, "Dowling, Brendan (ECY)" <BDOW461@ECY.WA.GOV>
Subject RE: Draft Bioassay Report

Follow up...Can charts comparing pore-water chemical results vs.. bioassay results be generated also. Thanks

---

From: Roland, John L. (ECY)
Sent: Friday, August 18, 2006 9:27 AM
To: Thomas.Sally@epamail.epa.gov; Rochlin.Kevin@epamail.epa.gov
Cc: 'Jim.Stefanoff@CH2M.com'; Dowling, Brendan (ECY)
Subject: Draft Bioassay Report

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Thanks Much,
John

----- Forwarded by Kevin Rochlin/R10/USEPA/US on 12/04/2006 02:03 PM -----

"Roland, John L. (ECY)" <JROL461@ECY.WA.GOV>

08/18/2006 12:43 PM

To Sally Thomas/R10/USEPA/US@EPA, Kevin Rochlin/R10/USEPA/US@EPA
cc Jim.Stefanoff@CH2M.com, "Dowling, Brendan (ECY)" <BDOW461@ECY.WA.GOV>
Subject RE: Draft Bioassay Report

Sorry, another request/question: Which of the sediment samples used in the bioassays had visible, or chemical pattern indications for the presence of notable slag? Thanks, John

---

From: Roland, John L. (ECY)
Sent: Friday, August 18, 2006 10:44 AM
To: 'Thomas.Sally@epamail.epa.gov'; 'Rochlin.Kevin@epamail.epa.gov'
Cc: 'Jim.Stefanoff@CH2M.com'; Dowling, Brendan (ECY)
Subject: RE: Draft Bioassay Report

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To: Thomas.Sally@epamail.epa.gov; Rochlin.Kevin@epamail.epa.gov
Cc: 'Jim.Stefanoff@CH2M.com'; Dowling, Brendan (ECY)
Subject: Draft Bioassay Report

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Thanks Much,
John
----- Forwarded by Kevin Rochlin/R10/USEPA/US on 12/04/2006 02:03 PM -----

Randy Connolly <connolly@spokanetribe.com>

08/18/2006 02:05 PM

To Sally Thomas/R10/USEPA/US@EPA, Kevin Rochlin/R10/USEPA/US@EPA
cc Shannon Work <shannonwork@indian-law.org>, John Roland <JROL461@ECY.WA.GOV>, Patti Bailey <patti.bailey@colvilletribes.com>, Rudy Peone <rudy@spokanetribe.com>, Gary Passmore <gary.passmore@colvilletribes.com>, Daniel Audet <Daniel_Audet@nps.gov>
Subject FW: Revised UCR Sed Tox Comments

Kevin, Sally,

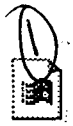
Attached are the Spokane Tribe's technical comments on the draft Technical Memorandum, "Upper Columbia River Site CERCLA RI/FS Summary and Evaluation of 2005 Sediment Toxicity Data, August 10, 2006".

Randy Connolly
Superfund Coordinator

-----Original Message-----
From: Fred Kirschner [mailto:fredk@icehouse.net]
Sent: Friday, August 18, 2006 10:29 AM
To: Randy Connolly
Subject: Revised UCR Sed Tox Comments

Dr. F.E. Kirschner, LPG, LPHG

AESE, Inc.
P.O. Box 50392
Henderson, NV 89016




http://www.aeseinc.com FK_ECOTOX_Comment.pdf _AVB certification_.txt

----- Forwarded by Kevin Rochlin/R10/USEPA/US on 12/04/2006 02:03 PM -----

Davidw Charters/ERT/R2/USEPA/US

08/21/2006 12:41 PM

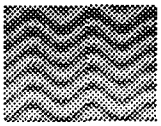
To Sally Thomas/R10/USEPA/US@EPA

cc Kevin Rochlin/R10/USEPA/US@EPA, Bruce Duncan/R10/USEPA/US@EPA

Subject Comments on toxicity testing

UCR Bioassay Commnets.doc

----- Forwarded by Kevin Rochlin/R10/USEPA/US on 12/04/2006 02:03 PM -----



Marc Stifelman/R10/USEPA/US

08/22/2006 10:15 AM

To Sally Thomas/R10/USEPA/US@EPA, Kevin Rochlin/R10/USEPA/US@EPA, Jim.Stefanoff@CH2M.com, dshelton@CH2M.com, Bruce Duncan/R10/USEPA/US@EPA, Davidw Charters/ERT/R2/USEPA/US@EPA

cc Mark Macintyre/R10/USEPA/US@EPA, Marianne Deppman/R10/USEPA/US@EPA, Charles Bert/R10/USEPA/US@EPA, Marc Stifelman/R10/USEPA/US@EPA, Burt Shephard/R10/USEPA/US@EPA, Bruce Duncan/R10/USEPA/US@EPA, Sally Thomas/R10/USEPA/US@EPA, Kevin Rochlin/R10/USEPA/US@EPA, David Croxton/R10/USEPA/US@EPA, Cara Steiner-Riley/R10/USEPA/US@EPA, Elizabeth McKenna/R10/USEPA/US@EPA, Monica Tonel/R10/USEPA/US@EPA, Jeanne Odell/R10/USEPA/US@EPA, Dan Opalski/R10/USEPA/US@EPA, Davidw Charters/ERT/R2/USEPA/US@EPA, Steve Ells/DC/USEPA/US@EPA, DavidE Cooper/DC/USEPA/US@EPA

Subject Comments: Upper Columbia River: Draft Summary and Evaluation of 2005 Sediment Toxicity Results

Sally, Team,

Please see attached:

mls Bioassay Comm.doc

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space available

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Marc Stifelman, Toxicologist
U.S. Environmental Protection Agency, Region 10
Office of Environmental Assessment, Risk Evaluation Unit
1200 Sixth Avenue, Mail Stop: OEA-095
Seattle, Washington 98101
Tele 206/553-6979
Facs 206/553-0119
stifelman.marc@epa.gov
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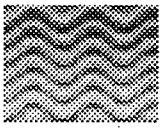
----- Forwarded by Kevin Rochlin/R10/USEPA/US on 12/04/2006 02:03 PM -----



Marc Stifelman/R10/USEPA/US
08/23/2006 08:54 AM

To Kevin Rochlin/R10/USEPA/US@EPA
cc Jim.Stefanoff@CH2M.com, Steve Ells/DC/USEPA/US@EPA
Subject Fw: Draft Toxicity Test Results Technical Memo review

see Steve's msg - he needs a copy

~~~~~~~~~~~~~~~~~~~~~~

space available

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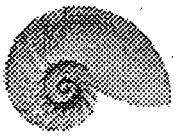
Marc Stifelman, Toxicologist
U.S. Environmental Protection Agency, Region 10
Office of Environmental Assessment, Risk Evaluation Unit
1200 Sixth Avenue, Mail Stop: OEA-095
Seattle, Washington 98101
Tele 206/553-6979
Facs 206/553-0119
stifelman.marc@epa.gov
~~~~~~

----- Forwarded by Marc Stifelman/R10/USEPA/US on 08/23/2006 08:53 AM -----



Steve Ells/DC/USEPA/US
08/23/2006 05:53 AM

To Sally Thomas/R10/USEPA/US@EPA
cc Bruce Duncan/R10/USEPA/US@EPA, Burt Shephard/R10/USEPA/US@EPA, connolly@spokanetribe.com, Daniel_Audet@nps.gov, Davidw Charters/ERT/R2/USEPA/US@EPA, gary.passmore@colvilletribes.com, JROL461@ECY.WA.GOV, Marc Stifelman/R10/USEPA/US@EPA
Subject Re: Draft Toxicity Test Results Technical Memo review

I never got this??

Steve

Stephen J. Ells
US EPA, OSRTI, 5204P

1200 Pennsylvania Ave. N.W.
Washington DC 20460
703 603-8822
703 603-9112 Fax
Sally Thomas/R10/USEPA/US

Sally
Thomas/R10/USEPA/US
08/09/2006 06:43 PM

To: gary.passmore@colvilletribes.com, connolly@spokanetribe.com, JROL461@ECY.WA.GOV, Daniel_Audet@nps.gov
cc: Davidw Charters/ERT/R2/USEPA/US@EPA, Steve Ells/DC/USEPA/US@EPA, Marc Stifelman/R10/USEPA/US@EPA, Burt Shephard/R10/USEPA/US@EPA, Bruce Duncan/R10/USEPA/US@EPA
Subject: Draft Toxicity Test Results Technical Memo review

Hello!
You will be receiving a draft Tech Memo from CH2M Hill regarding the bio-assay results from samples taken during the 2005 sampling effort by **Monday (8/14)** Its seven pages long (minus figures and appendices). Please review and provide comments to EPA by **Friday (8/25)**.

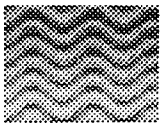
Here's how the copies will be distributed:

```
Dave Charters = 1

Steve Ells = 1

Region 10 = 6 to Sally

Ecology = 2 to John Roland

DOH = 2 to Rob Duff

CCT = 2 to Patti Bailey

EI = 2 to Valerie Lee

Spokane Tribe = 2 to Randy Connolly

DOI = 8 to Dan Audet
```

Feel free to call me with any questions.
thanks-
Sally

Sally Thomas
Superfund Project Manager
USEPA
1200 6th Avenue (ECL-111)
Seattle, WA 98101
(206) 553-2102

----- Forwarded by Kevin Rochlin/R10/USEPA/US on 12/04/2006 02:03 PM -----



Marc Stifelman/R10/USEPA/US

08/23/2006 12:17 PM

To Steve Ells/DC/USEPA/US@EPA

cc Mark Macintyre/R10/USEPA/US@EPA, Marianne Deppman/R10/USEPA/US@EPA, Charles Bert/R10/USEPA/US@EPA, Marc Stifelman/R10/USEPA/US@EPA, Burt Shephard/R10/USEPA/US@EPA, Bruce Duncan/R10/USEPA/US@EPA, Sally Thomas/R10/USEPA/US@EPA, Kevin Rochlin/R10/USEPA/US@EPA, David Croxton/R10/USEPA/US@EPA, Cara Steiner-Riley/R10/USEPA/US@EPA, Elizabeth McKenna/R10/USEPA/US@EPA, Monica Tonel/R10/USEPA/US@EPA, Jeanne Odell/R10/USEPA/US@EPA, Dan Opalski/R10/USEPA/US@EPA, Davidw Charters/ERT/R2/USEPA/US@EPA, Steve Ells/DC/USEPA/US@EPA, DavidE Cooper/DC/USEPA/US@EPA

Subject Fw: Comments on toxicity testing

----- Forwarded by Bruce Duncan/R10/USEPA/US on 08/22/2006 09:34 AM -----

Davidw Charters/ERT/R2/USEPA/US

08/21/2006 12:41 PM

To Sally Thomas/R10/USEPA/US@EPA

cc Kevin Rochlin/R10/USEPA/US@EPA, Bruce Duncan/R10/USEPA/US@EPA

Subject Comments on toxicity testing

UCR Bioassay Commnets.doc

----- Forwarded by Kevin Rochlin/R10/USEPA/US on 12/04/2006 02:03 PM -----

Jim.Stefanoff@CH2M.com

10/19/2006 08:04 AM

To Kevin Rochlin/R10/USEPA/US@EPA

cc jeff.schut@ch2m.com, dennis.shelton@ch2m.com

Subject UCR Bioassay TM Responses

Hi Kevin,

Attached is the summary table indicating path forward, via color coding, for each comment,

Jim UCR_Draft Bioassay Comment Responses.doc

(1)

AESE, Inc.

P.O. Box 50392,
Henderson, NV 89016
702-458-2025
http://www.aeseinc.com

MEMORANDUM

TO: Rudy Peone, Director

FROM: Dr. F. E. Kirschner, Senior Scientist

DATE: August 18, 2006

SUBJECT: Comments on "DRAFT Technical Memorandum entitled *"Upper Columbia River Site CERCLA RI/FS Summary and Evaluation of 2005 Sediment Toxicity Data, August 10, 2006"*

CC: Councilman Nicodemus
Randall Connolly
Shannon Work
File

This memo constitutes a review of the aforementioned document. The document was received on August 14, 2006. In preparing these comments, the Tribe has attempted to focus on issues that could make a difference in the RI/FS and ultimately selection of the remedy in the Preferred Plan.

General Comments

1. The document is heavily leveraged, relying on numerous draft documents that contain technical errors, omissions, unsupportable presumptions, and subsequent unsupportable conclusions. Therefore, this draft must be revised once the supporting works have been completed.

2. Results are inconclusive due to poor experimental design. In the most general sense, the response of the measured endpoints is related to both toxicity and physical habitat (both of which are functions of very large number of variables). As designed, it is not clear as to how variables associated with the physical habitat were constrained and if those variables were indeed similar between control (reference) and treated specimens. Therefore, one cannot discriminate between toxic and physical affects, as required by CERCLA.

   In summary, the causality models are useless due the large number of unconstrained variables. Since the samples have been discarded, the results are irreproducible. Re-running some of the experiments is not an option. In the event EPA designs a similar study in the future, the Tribe recommends that Pearl (2000) is a good starting place.

3. The criteria for the reference areas (Page 3) is incorrect or poorly stated. A reference area (control) should have all of the physico-chemical characteristics of the treated material, but for the treatment (contamination). Based on the geology of the substrate alone, it is evident that the reference areas do not meet these requirements. Pre-release sediments sampled from cores would probably serve as better reference material. However, these materials also have been discarded. The Tribe recommends that EPA refrain from any comparisons of "reference areas" and UCR sediments.

4. The COCs/COIs are not exclusively "slag related".

5. The recommendations section should be re-thought once all of the aforementioned problems have been rectified.

Specific Comments

1. Page 1 Section 1.0 Introduction; Paragraph 2 Last sentence:

> *"The exposure pathway of concern that is relevant to this technical memorandum is the* ***direct exposure*** *of benthic infaunal or epibenthic invertebrates to chemical constituents that are present in UCR sediment." [Emphasis added.]*

The "direct" exposure pathway described requires greater discussion. As written, it would appear that the "direct" pathway is a simple single pathway, where in reality the pathway includes, but is not limited to dietary, dermal, and inhalation (liquid-phase) pathways. Some attempts are made to constrain some of the endogenus and exogenus variables associated with some of these pathways (e.g. replacing decant water periodically); however, the degree of success of doing so is not evaluated.

2. Page 3; Section 3.0 Sediment and Porewater Samples Collected; Paragraph 3:

> *"Criteria for reference area selection included* ***location,*** *lack of contamination, and elevations greater than the maximum water level in the reservoir. The reference area sample locations were distributed over a fairly broad portion of the study area and provided a* ***representative range of sediment characteristics*** *(e.g., grain size, organic content) found in the area. Note that for the purposes of bioassay testing and analysis, the reference area comparisons were considered independently rather than collectively. [Emphasis added.]*

Comparable physico-chemical attributes are not necessarily a function of location. Please provide the underlying analysis used to conclude that the reference areas provide ***"representative range of sediment characteristics".*** See General Comment no. 3

4. Page 4; Section 3.0; Sediment and Porewater Samples Collected; Paragraph 1

> *In addition to the whole sediment samples, sediment water samples (referred to as "pore water" samples) were extracted from each of the bioassay and reference area samples via centrifugation. Sample centrifugation was performed at the USEPA's Manchester Environmental Laboratory. The pore water sampled exclusively for dissolved Contract Laboratory Program (CLP) TAL metals* ***plus uranium).*** *The pore water analytical results provided additional supporting data to assist with the overall interpretation of the bioassay results. [Emphasis added.]*

Where are the results for U total?

5. Page 6; Section 5.1; Bioassay Results; Paragraph 2; First Bullet:

> "• *Hyalella azteca* survival —14 of 50 samples had a statistically significant reduction from at least one of the reference areas."

Disregarding contamination for the moment, the solid-phase geochemistry of the substrates of each of the six reference areas are probably quite different. The solid-phase geochemistry of substrates of the reference areas and the sampled areas (treated) also are probably quite different. From this point alone, what use is this type of comparison?

6. Page 7; Section 6.2; Concentration-Response Relationships for Several Chemicals of Interest; Paragraph 1;

> *"When interpreting sediment bioassay results, the following three conditions are generally considered when identifying a causal relationship between a site-specific COI and sediment toxicity:*
>
> *1. A statistically significant difference in effects level between test sediment and control and/or reference sediment ($p < 0.05$ for survival, growth, fecundity);*
>
> *2. A biologically significant effect level for the specific test organism and protocol, as outlined in the test acceptability requirements (e.g., minimum mean control survival of 70 percent for C. tentans); and*
>
> *3. Evidence of a concentration-response relationship. That is, there should be geographic correspondence between measured concentrations and measured toxicity. "*

The above pertains to situations in which only a single COC is present in a single medium and is administered via a single pathway—none of which pertains to this study design. Due to the poor experimental design, single variable casual-affect relationships cannot be discerned since affects cannot be deconvoluted (See General comment 2).

Item No. 3 is incorrect. Response relationships are independent of geographic location.

6. Page 8; Section 6.3; Potentially Confounding Factors:

This entire section should include all of the uncertainties associated with the poor experimental design, described above. The statement regarding correlations should be qualified.

References Cited

Pearl, Judea. 2000. *Causality: Models, Reasoning, and Inference*. Cambridge: Cambridge University Press.

(2)

August 21, 2006

MEMORANDUM

SUBJECT: Comments on: Upper Columbia River Site CERCLIS RI/FS
Summary and Evaluation of 2005 Sediment Toxicity Test Results

FROM: David W. Charters, Ph.D.
Environmental Response Team

TO: Sally Thomas
Remedial Project Manager
Region 10

Subject:
Overall the data presented is good information and will be very useful in defining the risk associated with the Upper Columbia River Site. However the conclusions cited are not, I believe conclusions that should be transmitted to the Responsible Party.

Comments:

Section 5.0 Test results, 5.1 Bioassay Test Results. The technical group has previously discussed that the comparison of each bioassay test to each individual reference location is not statistically appropriate. Repeated two-sample comparisons (t-tests) between site and reference areas are not a statistically valid method for comparing multiple areas. For a single t-test, it is known that the probability of committing a Type one error (incorrectly rejecting the null hypothesis) is not greater than alpha. Repeated t-tests increase this error. For example if ten means are tested two at a time with alpha ,.05, error rises from 5% to 63%. Statistical error is no longer controlled.

Pooling of the reference data is recommended, if it can be demonstrated that data from the references are part of the same statistical population. If this cannot be demonstrated multi-sampling testing such as an ANOVA or non-parametric equivalent followed by multiple comparison tests which control statistical error should be explored. If references were to be utilized each reference station should have been selected to isolate an individual variable and should have been tested as such. Comparing each test to each reference is not appropriate. In this case it would also be appropriate for each sample to be reported as significant difference from Controls.

Section 6.0 Discussion of results specifically 6.1 Geographical Location Versus Response Relationships discusses the Results in a more general but more appropriate discussion.

Suggestion:

Eliminate the sentence starting Table 5-2. and the remainder of the section as the statistical procedures and their conclusions are inappropriate. Also table 5-2 should be eliminated.

While it might be interesting to have the statistical evaluation redone I do not believe that at this point it is useful. Data should be turned over to the Responsible party for further evaluation.

Section 7.0 conclusions

Fifth bullet. There are issues raised by the toxicity tests related to the physical properties of the sediments. The toxicity in the *Chironomus* vs. the *Hyallela* raise some interesting points that need to be investigated.

Suggestion: eliminate "or substrate particle size"

Section 8.0 Recommendations:

The recommendations are not presented in context with data quality objectives and are therefore of limited utility. The recommendations are effectively "we need more data." While this is most likely correct further data collections should be determined in conjunction with a problem formulation.

Suggestion: Eliminate the recommendations section.

(3)

EPA United States Environmental Protection Agency

U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Mail Stop: OEA-095
Seattle, Washington 98101

August 22, 2006

Memorandum

Subject: Upper Columbia River: Draft Summary and Evaluation of 2005 Sediment Toxicity Results
Dated: August 10, 2006

From: Marc Stifelman, Office of Environmental Assessment

To: Sally Thomas, Office of Environmental Cleanup
Kevin Rochlin, Office of Environmental Cleanup
Jim Stefanoff, CH2MHill
Dennis Shelton, CH2MHill

Cc: EPA UCR Team, including:
Bruce Duncan, Office of Environmental Assessment
Burt Shephard, Office of Environmental Assessment
David W. Charters, Emergency Response Team

Thank you for the opportunity to review the draft sediment toxicity summary document.

Currently, comparisons to reference areas are considered individually, but it may be better to either aggregate the six reference sites or to match representative reference sites to specific site samples based on substrate similarities. Because the statistical comparisons with the references stations form the basis of many of the conclusions, details of these comparisons should be described in the Methods section of the memorandum. Also, the adequacy and representativeness of the references areas should be discussed and reference site results should be presented graphically.

This draft is unresponsive to concerns raised by David W Charters (and others during our meeting in Spokane) about using multiple, individual statistical comparisons. I'm especially concerned because although Dennis Shelton was specifically tasked to remove the suspect comparisons, he neglected to do so in a subsequent presentation to the Tribes, Interior, and Washington. And now these suspect comparisons appear to have resurfaced in this draft.

Given statistical weakness apparent in the initial presentation of these results (and similar concerns we have and which were ignored) and in the statistical analyses for sediment, we should contract with John Skalski or another qualified statistician to review the analyses in this document (Stifelman, 2005). Our experiences have demonstrated the need for statistical expertise unavailable from CH2MHill.

If these concerns cannot be addressed within current time, budget, or contracting constraints, then the statistical analyses and consequent conclusions should be removed entirely and the this document will be reduced to a cover letter to transmit the data and experimental conditions.

Stifelman, M. (2005). Comments on Phase I Sediment Plan - e-mail dated March 2, 2005 pp. 2. R-10 EPA, Office of Environmental Assessment, Risk Evaluation Unit: Seattle, WA (attached).

Marc Stifelman

03/03/2005 03:27 PM

To: Kevin Rochlin/R10/USEPA/US@EPA, Sally Thomas/R10/USEPA/US@EPA
cc: Bruce Duncan/R10/USEPA/US@EPA, Burt Shephard/R10/USEPA/US@EP Riley/R10/USEPA/US@EPA, Charles Bert/R10/USEPA/US@EPA, Dan Opalski/R10/USEPA/US@EPA, David Croxton/R10/USEPA/US@EPA, Deb Neal/R10/USEPA/US@EPA, Edward Kowalski/R10/USEPA/US@EPA, Eliz McKenna/R10/USEPA/US@EPA, Kevin Rochlin/R10/USEPA/US@EPA, Ma Stifelman/R10/USEPA/US@EPA, Mark Macintyre/R10/USEPA/US@EPA, M Tonel/R10/USEPA/US@EPA, Sally Thomas/R10/USEPA/US@EPA, Thom Eaton/R10/USEPA/US@EPA, Jim.Stefanoff@CH2M.com, cgruenen@ch2m dshelton@CH2M.com, fdillon@ch2m.com, Bruce Duncan/R10/USEPA/US@ Cirone/R10/USEPA/US@EPA
Subject: Comments on Phase - 1 Sediment Plan

Although reference is made to a forthcoming Statistical Assessment Technical Memorandum, the optimal approach would be to specify as much of the statistical considerations up-front to better tailor the FSP design to intended data uses. Based on the current schedule, it seems impossible that the statistical tech memo can add value to the Phase I sediment sampling. To make more efficient use of limited financial resources applied to such a large geographic area, statistical review and design optimization must precede data acquisition (U.S. Environmental Protection Agency, 2000).

A designated statistical lead has not been identified in the Draft FSP. My early recommendation to utilize statistical sampling design expertise of Dr. John Skalski is not limited to fish sampling. Dr. Skalski's experience with designing environmental and biological sampling and analysis plans specific to the Columbia River combined with his local availability and competitive pricing have advantages that should be weighed against an alternative that utilizes staff less familiar with the study area and geographically remote from Seattle and Spokane. I urge you to follow-up with CH2 regarding Skalski's potential to assist with fish as well as other statistical sampling issues. It may be timely for EPA to prepare an RFP for statistical services on the project. I would be happy to assist in this effort.

Specific Comments

Table 2-1 Rearrange columns to place the *Parameter* column adjacent to the *Lowest Potential Regulatory/Risk/Technical Criterion* column to improve readability (i.e., move *Data Use* and *Data User* to right margin).

Page 5-1 Check Relative Percent Difference Equation. Both C1 and C2 are defined as the "larger of the two observed values".

Page 5-2 "relative standard (RSD)" is described where "relative standard deviation" may have been intended.

Reformat the equation for standard deviation (it looks like the ratio of individual observation to the mean when it should be the sum of the difference between the individual observations and the mean) squared. See example below:

$$\text{standard deviation, } S = \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + (x_3 - \bar{x})^2 + \ldots}{n - 1}}$$

Page A-2 Include EPA risk staff on UCR team in listing of "members of the planning and decision-making teams" for Human Health Risk Assessment (applies to benthic and bioassay sections as well).

Page A-3 Clarify that "risks" refer to incremental cancer risks and "hazard indices" refer to adverse non-cancer health effects.

Reference Cited

U.S. Environmental Protection Agency. (2000). Data Quality Objectives Process for Hazardous Waste Site Investigations EPA QA/G-4HW pp. 143. Prepared for U.S. Environmental Protection Agency: Washington, D.C. EPA/600/R-00/007 January, 2000. http://www.epa.gov/quality/qs-docs/g4hw-final.pdf

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